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AMERICAN GAS ENGINEERING JOURNAL

FORMERLY

AMERICAN GAS LIGHT JOURNAL

VOL. CXI., No. 9
WHOLE No. 3208

NEW YORK, SATURDAY, AUGUST 30, 1919

Subscription $3 per year
$4 Canada $5 Foreign

A Correction

On the front cover of our last week's issue was an advertisement of the Cast Iron Pipe Publicity Bureau quoting a statement of W. R. Addicks, Vice-President, Consolidated Gas Company of New York, referring to the introduction of cast iron pipe about 1808 as "An Epoch Making Influence in the history of the Gas Industry," and as "greatly aiding in making the gas industry prominently successful."

The statement, which was made in the paper on "Some Notes on Gas Standards," presented by Mr. Addicks before the New York Section Illuminating Engineering Society, was correctly quoted, but the date of the paper was given as "Nov. 9, 1816." This should have been "Nov. 9, 1916."

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AMERICAN GAS ENGINEERING JOURNAL. Aug. 30, 1919. Vol. CXI, No. 9. Published Weekly by American Gas Light Journal, Inc., New York, N. Y. Subscription Price $3 per Year; $4 Canada; $5 Foreign.
Entered as second-class matter January 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

American
Gas Engineering Journal

FORMERLY THE AMERICAN GAS LIGHT JOURNAL

Vol. CXI, No. 9 NEW YORK, AUGUST 30, 1919 Whole No. 3207

Locating—or Relocating—the City Gas Plant

Viewed from the Economic Standpoint It Is Seen that New Factors Governing Proper Location Enter into the Reckoning as Time Goes On

By L. W. ALWYN-SCHMIDT

The local effectiveness and financial prosperity of a gas enterprise is decided practically entirely by its location. There are many gas plants in this country which have lost in usefulness for the locality served by them because their founders omitted to locate their generating plant on the proper spot. Effectiveness of a gas plant in the economic sense of the word may have a variety of different meanings. The measure of effectiveness of course must always be the character of the service rendered by a plant. If this service is insufficient or unduly expensive the grade of effectiveness declines. It may decline to a point where the whole enterprise becomes useless to the community and the consumers begin to employ other forms of heating or lighting than those provided by gas. Owing to the peculiar character of gas the transmission of the service plays a large part in its effective execution.

This is the cause why location is so important a factor in the life of a gas plant. The gas is carried in pipes to the consumer. These pipes have to be laid underground and they represent a considerable part of the investment of the enterprise. If a man goes to a hardware dealer and buys a hundred yards of string, he pays a higher price than the man who buys only fifty yards. The length of the string in fact regulates the cost to the consumer. Not so in the case of gas. The length of the pipe line has little to do as a rule with the cost of gas. The price of gas is regulated by the application of a flat rate which is the same for the consumer at a hundred yards distance from the generating plant as for the one living a thousand yards away. This system of computing rates is the same in most public utilities. It has been applied in the case of most local trolley lines but it has been luckily excluded from railroad enterprise.

Cause of Much Financial Troubles

While it may be correct in principle for such public utilities as gas and electric light it remains nevertheless faulty commercially. It overcharges the consumer in near proximity to the generating plant in favor of that on the end of the distribution line.

It can hardly be corrected but it is the cause of much of the financial trouble of many gas companies in this country. Consider the case of a gas company which has been located originally in the heart of its most active consuming field in a small community. When the gas plant was built it had most of its consumers in its immediate neighborhood, a matter of a mile or so in radius. With the progress of years the community began to grow in a direction unforeseen. Most communities in this country seems to grow westward. Let us assume the same was the case in the present example. The city now represents the aspect of a cluster of older houses concentrated in an eastern quarter, while all the better class houses and the factories are located along a few roads developing in a western direction. The main distributing center of the gas plant is no longer in its immediate vicinity but several miles further west. If rates are regulated on the basis of an average distance of the conduct pipe lines, the company will have a great majority of consumers on the longer lines, while the number of consumers on the shorter lines is comparatively small. The example may be stretched a little further to a point where the vicinity of the gas company is entirely deserted by residential dwellers and where all domestic consumption takes place at a location several miles removed from the generating plant. No doubt the distribution expenses must be very high in such an instance.

Two Means of Attacking Problem

There are two means by which this problem can be attacked. One is to raise the price of gas so to compensate the company for the higher distribution cost. The second is to remove the generating plant to a more suitable location near the principal new distribution center. The first step has been attempted in several cases and, as must be stated, in a few instanecs with very disastrous results to the prosperity of the gas company. There are certain reasons why an increase in rates is not always opportune. Gas after all is a commercial commodity like any other industrial product. If gas is cheap it will be bought in large quantities. If it is expensive the consumer may reduce his purchases or he may even change to other forms of lighting and heating. High gas rates are a direct invitation for the formation of a local electrical plant and it may be cheaper for the consumer to go to the trouble of buying

coal for cooking purposes instead of using it in its gaseous form. A limitation, therefore, is set to the possibility of correcting the rise in distribution cost caused by an increase in the distribution distance. The price cannot be raised higher than the cost of the similar service when rendered by other light or heat producers.

The second solution is not less easily applied. Removing a whole gas plant from one location to another is a very complicated matter, especially if the operation has to be accomplished in a small community. One cannot take a gas plant rendering a public service and dismantle it for reconstruction at another place nor can one lift it bodily as is done occasionally with dwelling houses. Under present financial conditions the latter seems to be as impossible to execute as the first. Most medium gas plants have all hands full to do just now, to make the investment pay. They would find is very difficult to pay at the same time for a completely new plant especially as the old plant would hardly be of any use in the future. Nevertheless this matter of relocation will become an urgent necessity in the case of many gas plants in this country in the very near future and it has to be considered, therefore, in its economic aspects.

Need of Intimate Study

The question of where to relocate a gas plant is one that can be answered only after a very intimate study of local conditions. Whether the plant should be relocated is in most cases largely a matter of cost of production and distribution. In some cases the fault in the distribution may be corrected by locating a supplementary plant in the mostly affected district with a view to take care of the more costly consumers at a lower cost as that incurred by the principal generator. After the relocation, however, has been once decided upon it should be executed in such a manner as not to lay the enterprise open to a soon recurrence of the same trouble. The conditions governing the relocation of a gas plant are practically the same as those applying to the location of new enterprises. Similar tests for the suitability of the different available sites have to be made in each case.

The location of a gas plant is affected both by local and national influences. The local factor influencing the selection of a site are mostly considerations of distribution while the national factors are such as railroad connections, accessibility to coal fields, waterways and similar. Unlike other factories a gas plant cannot be located away from its distribution center. It differs in this respect from most other factories.

Where the Law of Averages Works

Its selection of community is determined aforehand by the name of the city in which the gas plant is to be erected. The site for the plant must be found somewhere in this city or in its near vicinity. But a city of even medium size may offer many possibilities for locating a gas plant. A gas plant in such a community may be faultily placed in the beginning, as was shown above, or it may be put on a site which by its own economic advantages secures the future prosperity of the enterprise.

Which of the many available sites in your city belongs to the second group? If as will be the case in the majority of instances, the city already has a gas plant and a relocation has to be made adjusting the location of the generating plant to the new conditions, it is comparatively easy to establish the new center of gravity of gas distribution. Also an indication would be given in this city as to the direction in which it will continue to grow after having started once to expand above its old boundaries. Cities are as a rule very conservative in their growth. Having once started to wander they follow the initial lead. So there is little danger to assume that the population movement will continue in the same direction. No such guidance, however, is to be obtained in cases where an entirely new plant has to be built in a community which so far has not had the advantage of gas. In this instance the example of other cities showing similar conditions is best drawn upon. The law of averages works here with fair perfection. Take a city in character similar to that in which the new plant has to be erected. See how the distribution has proceeded in the course of years in this particular community and apply the experience obtained in this manner to the case in hand. The test should be made with reference to several similar examples in the vicinity and the result will be fairly satisfactory. The plant in this case could be located with some certainty in the principal center of distribution to be expected in the vicinity. This, however, will not protect the new plant against the most important changes in the population movement of the city. Possibly the community shows already a decided tendency as to the movement of its population which naturally would have to be taken care of by removing the plant sufficiently ahead of this movement as to give room for hope that it may meet it in future. But there are still many communities in this country which have not yet started to move. They have not been reached yet by that industrial development which is the principal cause of the agility of the residential district playing so much havoc now with the localization of our gas plants. In this case a careful study of local conditions will have to be made. Where in the vicinity of the city are to be found the best possibilities for a residential quarter? Which are the most desirable locations for a factory and other industrial settlement? These are the questions which have to be answered before a decision is made. As the location of the plant is mostly in the hands of local interests being partly responsible for the financing of the project, it is mostly easy to obtain local advice in this very important matter. The plant should be located in every instance in such a way as to remain in reach of all parts of the city to permit a perfect equalization of the distribution cost, eliminating the necessity of carrying a large load of expensive consumers on the books of the company at unprofitable rates.

A Limitation to the Rule

But there is a limitation to this rule. The business of a gas company does not consist only in selling gas. Its still more important occupation is the production of the commodity. The most ideal location for the facilitation of distribution will be without value if it does not take into consideration the production end of the industry. The principal raw material employed in the manufacture of gas is coal. Coal, therefore, has to be transported to the generating plant. As it is not found as a rule in the neighborhood of the city, it may have to be sent over long distances by rail or water. The price of coal, unlike the price of gas, changes with the distance from the mine. It cannot be in the interest of the generating plant to increase its production cost by adding unnecessarily to the cost of transportation. Many gas plants, therefore, have been located by their founders in the immediate neighborhood of the railroad sidings

or they own their own permanent ways for carrying the coal to the plants.

Railroad building has not proceeded always in this country on the most economical lines. Financial considerations often have directed the course of a railroad with the result that many cities have to-day their stations at a point outside the city limits. This is very unfortunate for the gas plants and has in fact impeded very much the progress of the gas industry in this country. When the condition exists it has to be borne with equanimity. If the depot is so far removed as to make necessary a special siding, it is no doubt the best not to worry about locating near the railroad, but rather select the best distributing point and bring the coal to the plant by way of this special siding. Otherwise, there may be a financial advantage in locating near the depot and get the coal first hand.

Whenever there is a waterway by which coal can be transported the waterway should be investigated as to its possibilities. Water as a rule offers cheaper opportunities for transporting coal than the average railroad connection, but it has the disadvantage that it is not quite as reliable, and is frequently interrupted entirely during the winter.

A New Factor Enters

The new earning possibilities added to the income of the gas plant by the expansion of the by-product industry has given special importance to the selection of a site in easy reach of the railroad apart from considerations of the coal supply. By taking up the manufacture of by-products the gas works have become factories in the industrial sense. They are not any more only service companies manufacturing a commodity, the sale of which is regulated by public policy, but they are also making an article which is sold in the free market as a commercial commodity. To manufacture this commodity at competitive rates and to market it with all the advantages of distribution in its favor requires a location which will permit easy access to the freight depot of the city. The gas works are in this respect in the same position as any other factory. In fact the bulkiness of the product may make such a location still more imperative than in the case of any average industrial enterprise.

It is desirable that the gas plant should be easily accessible in the local sense, meaning it should be located in reach of a trolley line or any other public communication line. The average gas plant does not employ a large number of men. It is, therefore, not necessary that it should be reached equally well from all parts of the city, as is the case with factories having a large number of employees living distributed all over the city. But easy communication with the rest of a city is certainly an advantage for any industrial enterprise of that character whatever. This rather contradicts the earlier policy of the large gas works which seem to have settled in any sort of a neighborhood, provided only they could get the coal cheaply to it and the site could be acquired at a reasonable price. The latter consideration, of course, still affects the selection of a location at the present time. But it is doubtful whether a few thousand dollars more or less paid for the site will really affect very largely the financial results of a gas plant, especially if the location offers other great advantages from the point of view of distribution and supply of raw materials.

Local Competition

This so far has not taken into consideration the question of local competition. The situation naturally changes a good deal when two gas works compete in one district with overlapping fields of distribution, as will be the case here and there. In such instances, which, however, are not very frequent outside the larger cities, the more favorable location of one of the plants may be deciding upon the commercial success of one of the two competitors. If, for instance, one of the gas works should be located directly on a canal permitting the cheap transportation of coal while the other has to use railroad transportation and possibly sidings, the first of the two no doubt starts competition with an advantage which can not be so easily equalized by the less favored competitor. This will be especially noticeable in areas where the gas rate has been fixed for the whole district, making it practically impossible for the second plant to reimburse itself for the loss in location by higher prices for the product.

The situation is one which should have the earnest thought of intending builders of gas works, new or in the way of relocations. There is no saying what will be the possibilities of any district. America offers wondrous examples of rapid growth and a little city hardly able to support one gas plant to-day, and where there is no franchise stipulation to prevent it, may have two or even three in a few years after a thorough American boom has reached it. The plant which in such a case has the advantages of location is the plant that will survive the boom if a break should come and will finally hold the market. It may be as well the first plant on the spot which may be the survivor instead of any of the newcomers. Certainly the first plant on the spot has all the chances for picking its location. If its founders can predict with some certainty how matters will develop it should certainly start operation with a fair chance for future success. The growth of the city should be a matter of satisfaction to its shareholders and not as is now ferquently the case, a cause of permanent anxiety, that the demand for gas distribution may outrun the boundaries of economical distribution. We have much to learn in this country in the matter of locating our industries, and the gas industry by no means stands alone in this respect. Governmental investigation in fact has shown that a great many of our industries have been faultily located originally and are operating in consequence under an undue handicap of distribution and manufacturing cost. This should have been eliminated, if the plants had been built right in the beginning in localities offering better conditions for their development than those selected by their founders.

Three Hundred Pressing Irons in One Establishment Help to Make a Consumption of 750,000 Cubic Feet a Month

The Hart, Shaffner & Marx Company, of Chicago, have ordered gas for their new plant on St. Paul Avenue, to be used in twenty high pressure steam boilers anad three hundred pressing irons. In order to operate these appliances it will require three-quarters of a million cubic feet of gas a month.

Manufactured Gas Used to Produce Oil

Still Devised by Gas Company Superintendent Will Extract Oil from Shale at a Cost Low Enough to Meet Competition from Supplies from Wells

By JAMES E. DARST

Through the use of artificial gas as a fuel, G. W. Wallace, superintendent of the St. Clair County Gas & Electric Company, has been able to perfect a still, which will force the immense shale fields of Colorado and Utah and the smaller ones of Missouri to the rescue of the petroleum supply of the country. While the distillation of oil and by-products from shale has been carried on to a limited extent in Scotland and Europe since the beginning of the eighteenth century, up to this time no process had been discovered which would make a large production a commercial practicality. It is claimed for Mr. Wallace's process, however, by engineers in the employ of New York capitalists, that it will produce oil at a cost which will enable it to be marketed in competion with the oil-field supply.

Heat and Pressure Required

The plant consists of a still, in which the shale, broken up into small fragment, is placed under heat and pressure. The fuel used is artificial gas and the heat is applied at the bottom and two sides of the still. Mr. Wallace stated that in addition to being the most convenient fuel, gas was by far the cheapest and made it possible to cut the cost of producing the oil to a point where it could compete with the supply from the oil-fields. An asbestos gasket is used to make the cover of the still absolutely gastight. The volatilized products are led off to a condensing chamber, which condenses the gases, having a high vaporization point. Those gases, having a low vaporization point, are conducted from there to a condensing coil, surrounded by water and condensed there.

Experiments with the plant have been carried on for over a year and Mr. Wallace now has it to the point where about forty gallons of oil can be produced from one ton of shale. The oil is of extremely good quality and contains large quantities of high-grade gasoline.

22,000,000,000 Barrels of Oil From the Shale of Colorado

It is estimated conservatively that the fifteen hundred square miles of shale fields in Colorado will yield more than 22,000,000,000 barrels of crude oil under this process. The Colorado Bureau of Mines, which has tested fourteen other processes for extracting the oil and by-products from shale, is declared to be very much interested and was represented at recent tests of the process by James Duce, head of the Bureau.

The erection of a plant for refining the shale oil is being started at Debeque, Col., in the center of the shale fields, by F. D. and H. W. Beattly, of New York, who own several hundred thousand acres in the fields. It is proposed to make the plant large enough for the refining of two thousand barrels a day, though the maximum production will not be attempted immediately. A five hundred barrel producing plant is also being erected and other producing plants will be built later. The New York capitalists have been given the rights to the process in the State of Colorado and it is planned to sublet these rights to companies, owning other portions of the shale fields. Rights in the State of Utah have been contracted for in the same manner. The process has been patented by the Wallace Coke, Oil & By-Product Company, and is the property of that company.

Not the most startling but, perhaps, the most immediate practical feature of Mr. Wallace's process is the fact that it cokes almost every grade of coal with good results in approximately one-fourth the time taken by the oven process. Heretofore coal mined in the Middle West and marketed in St. Louis, has not been used extensively for coking or the manufacture of gas because of the poor results obtained. Plants to coke coal have been established in several Illinois cities, but have soon been abandoned, operators complaining that the processes they had adopted turned out a poor quality and texture of coke from the bituminous Illinois coal used.

Coking Accomplished in Four Hours

Under this new process, however, the different Illinois coals have produced a high-grade coke, having all the properties of exceptional metallurgical coke. The amount of by-products, obtained under the process, is 10 to 12 per cent higher than with the oven process. The coking is accomplished in four hours, one-fourth of the time taken before. Tests were made on coal from the following Illinois mines: Big Muddy, Duquoin, Carterville, Peabody, Royalton, Collinsville, Bond City and Williamson County. Although the mines are located in several sections of the State and a different grade of coal is obtained from each, the total yield ran generally the same. From one ton of Big Muddy coal the following products were distilled: Crude oil, 20 gallons, gasoline 3.66 gallons, lubricating oil 1.94 gallons, crude carbolic acid 2.82 gallons, crude creosote 4.30 gallons, pyridine, 4.50 pounds, ammonium sulphate 30 pounds, and coke 1,300 pounds. The tests on the other Illinois coals averaged much the same.

Lieutenant F. S. Ryus, representing the United States Bureau of Mines, the Alaskan Engineering Commission, the Geological Survey and a large Alaskan Mining concern, is in East St. Louis to make exhaustive tests of the new process, and has expressed himself as well pleased with the results he has obtained, both in the production of oil from shale and the production of coke and by-products from coal. Lieutenant Ryus said that the price of gasoline in Alaska, which has been from 75 to 85 cents a gallon will be materially reduced by the new process. He is having thirty pounds of Alaskan coal shipped in order to make coking tests with it.

Canada's Coal Supply a Matter of International Moment

Arthur V. White Explains Why Supplying Nations May Demand of Canada that She Utilize Her Own Resources Before Seeking of Them Supplies that May Mean a Deprivation to Their Own People

That Canada's coal demand, owing to new world conditions, has become both a serious international and national problem was clearly brought out at the Canadian Gas Association Convention at Niagara Falls in an address by Arthur V. White, consulting engineer of the Commission of Conservation of Canada.

"Apart from the maintenance of the proper morale of the nation and of the sources and distribution of food, there is, I believe, no question involving physical matters which is of such vital issue to Canada as her fuel problem," stated Mr. White. And he added that "Through failure to deal adequately and in a broad, statesmanlike manner with her national fuel problem, Canada courts trouble, and, I believe, may yet experience such a 'pinch' with respect to her fuel supplies as will seriously affect her economic welfare, involving of course her financial institutions."

The speaker made a brief and comprehensive survey of present world coal conditions in which was emphasized the great fuel shortage in the countries of Western and Southern Europe. Great Britain, having been the great coal exporter to France, Italy, Norway, Sweden and Portugal, will fall 25,000,000 tons short of meeting the demand of these countries in the present year. Britain's export of coal has constituted in point of value 8½ per cent and in point of weight 75 per cent of her total export trade. The coal shortage in France was shown to be still a serious problem. Conditions in Italy are characterized as desperate. In Germany, coal conferences of experts from all parts of the country have been in session to devise means by which Germans will not freeze during the coming winter. The German Minister of Economics has intimated that the passenger traffic may have to be discontinued this fall in order to use all available equipment to haul coal and move crops. The smaller countries, like Norway, Sweden, Denmark, Holland and Switzerland, are also short of coal. These conditions were cited by the speaker because all these countries are now looking to the United States for coal.

Canada's Needs

Mr. White pointed out that inasmuch as the governments and peoples of Europe are seeking a maximum of relief through coal shipments from the States, that Canada is directly and deeply interested because she imports from 15,000,000 to 20,000,000 tons of coal—anthracite and bituminous—from that country. The speaker went on to say that, while Canadians have in a measure become dependent upon the United States coal fields—and it is to be expected that they will be dealt with in all fairness where necessary to effect future readjustment relating to Canada's fuel supply—yet he added:

"It is important, however, to take cognizance of the fact that a nation pressed by the demands of its own people may be compelled, under certain conditions, to deprive other nations—in part at least—of even the necessaries of life until the needs of its own citizens are met. No country can be expected to send out of its confines that which is essential to the very existence of its own people."

It would not be surprising, said the speaker, if a country like Canada, with vast fuel resources, were directed to speed up its utilization of its own fuel and would not be left undisturbed, so to speak, in its enjoyment of burning what is now one of the luxuries of the world, namely, anthracite coal from the coal fields of Pennsylvania.

Coal conditions in the United States were also reviewed, and it was shown that the States are greatly taxed to meet even most pressing and immediate coal needs, and it was commented that "No matter what her good-will or desire towards Canada may be, the United States may not be able to cope with her own and the prevailing world need."

The query was put whether anyone could reasonably find fault with the United States coal merchants if, in their efforts to capture as much as possible of the 160,000,000 tons of annual international coal trade, they sought to deal where they could do so most advantageously.

The various facts presented clearly showed that there was scarcely any aspect of world conditions of more serious moment—immediate or prospective—than this coal problem, and the speaker stated that:

"Whether conditions of curtailed fuel supply for Canada be delayed from materializing this coming winter or next winter, or until some time in the future, nevertheless I am firmly convinced that there is no menace to Canada's economic and general welfare at all comparable to the fact that she is at present so largely dependent upon a foreign country for her fuel needs."

The strongest possible emphasis was placed upon the necessity for Canada to develop her own fuel resources. These were mentioned. The speaker deprecated the tendency to boast about the extent of these resources, remarking:

"It seems out of place to emphasize how much we have latent when alongside of it we are not able to show how beneficially these assets are being used both for our own support and for the assistance of other needy nations. When the population of the Prairie Provinces are insured against yearly fuel shortage, we shall be more interested in hearing emphasis laid upon the enormous fuel reserves of these provinces; and when Canada produces more than the present amount of 2 per cent of her total annual oil consumption we shall be more interested in having emphasis placed upon the statement that we have the biggest oil fields in the world."

The speaker counseled: "Canada's only sane policy is to develop, and that as rapidly as possible, both her own fuel and power resources, and by co-ordination of transportation and other cognate agencies to provide for the distribution of fuel to all communities in the Dominion. In some respects it is more important to move coal and have it adequately stored and distributed throughout Canada than it is to remove the grain out of the country."

He advocated that through governmental and financial agencies, similarly to what is done with respect to the grain crop—assistance might be rendered to a large proportion of the wage-earning population who covet the ability to lay in their coal early, but who are unable to finance the proposition.

Central Research Laboratory for Gas Industry

With respect to the gas industry, Mr. White advocated the establishment of a central research laboratory where the more technical problems relating to the industry could be solved for the benefit of all.

The great importance of the gas industry to the fuel problem was pointed out in his closing words to the delegates to the convention:

"Gentlemen, you operate in a great and unique field which comprises the effecting of economies by subjecting raw coal to such manufacturing processes as will save the valuable by-products and at the same time produce, even from inferior grades of coal, a satisfactory and clean-burning fuel. It is within your province also to aid in effecting a proper co-ordination of the uses of electricity, coal and gas, according to their respective spheres of most efficient use. This oftentimes will result in a greater utilization of gas. Those in the forefront of the gas-producing industries are justified in looking forward to the greatly increased use of this commodity, and to the fuller recovery of by-products. Your contribution to the solution of the national fuel problem of Canada is invaluable. Your field has an ever-extending horizon. I trust you will all find it a truly profitable one for the enthusiastic exercise of your talents."

Shortcomings of the Water-Gas Process

John Harger Emphasizes Importance of Preheating Air Blast—Improving Efficiency by Increasing Depth of Fuel Bed

If, in practice, the manufacture of water gas was generally carried out as it is supposed to be from paper descriptions, there would be little room for improvement. In the majority of cases, however, the process is left to look after its own welfare, and is carried on in much the same way as when first introduced some forty years ago, declares John Harger in the second number of the new British weekly *The Chemical Age*. Many important suggestions for improvement have been advocated from time to time, but these have seldom been acted upon, with the result that the process is still conducted on comparatively inefficient lines. The following criticisms and suggestions are made with the object of indicating some of the directions in which higher efficiency will probably be obtained in the future.

In the first place, the air blast enters the generator cold and leaves it red hot. In blast-furnace practice there is no difficulty that has not been overcome in introducing air which has been highly heated by suitable plant using the waste gases to supply the heat; the reason why this economy has not been introduced in the water-gas process is unknown, but it is possible that the engineers who have developed and designed the plant have not had sufficient chemical knowledge to realize the importance of a hot blast. It is chiefly the iron grate of the generator which is in the way of the introduction of the hot blast, but, with the example of the modern blast furnace, it is clear how unnecessary such a grate is, and, with a suitable design of plant, there should be no difficulty in dispensing with it and using a hot blast instead of a cold one. This change would increase the economy by 10 per cent or more, and do away with the clinkering, which is one of the worst features of the process. Moreover, with a hot blast the ash would be removed in the molten state. Again, the waste gases from the "blow," in addition to being red hot, generally contain a considerable quantity of unburnt gas, and the air blast is always worked at a uniform rate throughout the "blow."

In dealing with these considerations the following points are of importance. Special trials showing figures of 1 to 2 per cent of unburnt gas may be neglected, for such results are not met with in actual every-day practice. In fact, 7 to 10 per cent unburnt gas in the waste "blow" gases will be nearer the truth, and there is frequently 15 per cent.

Heat Storage

In the "blow" stage of water-gas manufacture it is immaterial whether the heat is stored in the coke *or in the coke plus some inert refractory material*, such as firebrick, but for efficiency it is essential that the heat so stored must be at high intensity, and available during the "run" to heat up the steam to 1,000 deg. C. or more—*i. e.*, it must be available at a high temperature. It would appear that one development for greater efficiency in water-gas making in the future lies in the use of brickwork carefully designed to function as a heat store during the "blow," and as a heater during the "run" and "blow." To a certain extent the Kramer and Aarts process makes use of brickwork as a store for heat, and in consequence the efficiency of this plant, worked under perfect conditions, is about 75 per cent, against the Dellwick 65 per cent, but these figures do not allow for the fuel uesd for power and for steam or for stand-by losses.

To obtain greater efficiency as much heat as possible, at as high a temperature as possible, must be stored in the fuel and in brickwork regenerators. In order to do this the writer proposes to arrange for complete combustion of the "blow" gases by the addition of hot air immediately before or after leaving the fuel bed, and to store this heat at a very high temperature in the coke itself, and in a large quantity of perforated brickwork arranged in close proximity to the coke. This brickwork should be heat-insulated to reduce the amount of heat conducted and radiated away from one portion to another, because heat intensity is the factor required for success. The regenerator should be designed in several sections, each one heat-insulated from the others, the gases passed from one of these sections to another (and finally used to generate steam in a boiler if the plant is sufficiently large). The steam during the "run" and the cold air used with the "blow" should be passed through all the brickwork in the reverse order.

Insuring Complete Combustion

It is evident that the process can be considerably improved in efficiency by working with a deep fuel-bed of 12 ft. instead of 5 ft. or 6 ft., provided the method of introducing the air blast is suitably modified—for instance, by introducing air, preferably hot, at several different levels, somewhat after the style proposed in the original Dellwick plan; but in the new scheme, instead of having the air-supply pipe placed in the middle of the fuel, which is quite impracticable, to have the air inlets through the shell and lining at different levels. All these

air holes at different levels could be worked together, or only those at one end first, and then these could be stopped, and the others further along could be brought into action as the "blow" progressed. At the same time a set of air inlets within a few inches from the exit end of the bed of fuel would be in action during the whole period of the "blow," this latter provision being to insure the complete combustion of the blow gases.

In the process as at present conducted the steam enters the generator at a comparatively low temperature, seldom above 350 deg. C., whilst the water-gas and excess of steam leaves at a higher temperature (800 deg. C., or thereabouts), and the steam is forced in at a uniform rate throughout the "run." The low temperature of the entering steam could be improved upon if regenerators were used, for with such regenerators the steam would be passed through the water-gas generator at about 1,000 deg. C. or more, passed through the coke yielding water gas, and then through a second regenerator chamber (cool), made on the same principle as already described, which would become heated up for the following air blast.

It is evident from what is known about the reaction velocities of carbon dioxide on coke that as the coke cools, the steam should be given longer contact—*i. e.*, it should be passed at a slower rate; this would, of course, yield more water gas of a better quality and save steam. Some automatic appliance for effecting this is required, and the writer believes that a special governor for the purpose has been introduced.

Direction of the Blow

In most water-gas plants the air blast enters from below and carries away a considerable portion of small coke, which is wasted and becomes a nuisance. The waste of coke due to this cause probably amounts to 2 to 5 per cent of the total coke used. The remedy is to substitute a downward "blow" for the more usual upward one, and this has been proposed in the Loomis generator. A downward "blow," or a horizontal one, as suggested by the writer, entails the abolition of the iron grate, and probably necessitates the removal of the ash in the molten condition, but as most of the present waste in the water-gas process can be traced, directly or indirectly, to the presence of the iron grate, progress demands this abolition.

Again, the steam is generally run in the same direction as the air blast. It must be evident that for economy of heat in the process, the steam "run" and the air "blow" must be in opposite directions, otherwise the fuel and any checker brickwork cannot act on the regenerative principle in an efficient manner. It is claimed that running the steam in the same direction as the "blow" makes the generator temperatures more uniform, and there is not an excessive wear on one particular part of the lining. There may be something in this contention but experience shows that the chief wear on a *good* lining of a water-gas generator is mechanical, and is caused by the tools used to remove clinker. The chief obstacle to working the "run" and "blow" in opposite directions is again the iron grate, which would get too hot and collapse or wear away quickly.

In generators as employed to-day there is too much dead space above and below the fuel. This is chiefly a matter for a slight alteration in design in pipe connections and in the generator; very often the dead space below the bars and between the top of the bed of fuel and the outlet is very excessive, apparently no attempt having been made to design the plant to give the least possible dead space. Yet for most purposes water gas is better without unnecessary nitrogen and carbon dioxide, and for certain uses 4 to 5 per cent of nitrogen is a grave disadvantage. An existing plant can generally be put right by a few hours' work spent in altering the connections, and can then be made to yield water gas with 1 per cent or less of nitrogen, whereas with the existing arrangements the gas may contain up to 4 or 5 per cent.

Finally, it may be mentioned that water-gas generators require to be more efficiently heat-insulated. The usual mistake made in heat insulating is to use firebrick of great thickness, say, 16 in., with 2 in. to 3½ in. of asbestos fiber packing between the firebrick and the steel shell. The better methods is to use 9 in. to 12 in. of firebrick lining, then 4 in. of Kieselguhr brick, and then from 2 in. to 5 in. of Kieselguhr powder next to the shell of the generator.

Finds Means to Estimate Flow of Gas Through By-Pass

The impossibility of measuring the gas flow through the "by-pass" valve during the temporary removal of the meter is an old problem. Its probable solution has just been accomplished by Thomas Noonan, foreman of the South Shop of the Peoples Gas Light & Coke Company, of Chicago, who has invented a device for metering gas passing through the by-pass.

Mr. Noonan set himself to work out the problem of measuring the gas consumed by manufacturing concerns which cannot have their fuel supply interrupted, even during the temporary removal of the meter. The by-pass valve set on an industrial installation has been perfectly efficient in the matter of allowing the flow of gas, but has afforded no means of checking up on the number of feet used. Mr. Noonan succeeded in constructing a device which will gauge accurately the amount of gas used.

The device consists of a valve placed on the by-pass pipe which connects the service to the riser. This valve is connected by a stem to the clock in the Bristol recording gauge placed immediately above it. The action of opening the valve stops the clock and the recording mechanism, thereby definitely determining at what time the meter was by-passed. A feeder box is also actuated by the stem when the valve is closed. From these facts and the known capacity of the pipe it would be a comparatively simple matter to ascertain the amount of gas consumed during the time the meter was out of commission.

After examining Mr. Noonan's invention, John Williamson, on behalf of the Peoples company, presented him with a check for $100 as a testimony of the company's willingness to encourage efforts toward improving the industry. Mr. Noonan has made application for a patent.

Where Gas Enters in the Making of Syrups

Process Involved Essentialy Simple—Distilled Water an Essential—Also Gradual Heating

By GILBERT C. SHADWELL

The manufacture of syrups has become to be a very considerable trade. Due to the fact that in making them great care has to be exercised in the heat regulation gas has indeed become the one fuel which is sought after for the necessary purpose.

A standard cauldron furnace will answer the purpose if haste in fitting an appliance is necessary, but it is far better to have a special type of furnace with a projecting edge not heated by the flame and extending beyond the limits of the furnace jacket. But more of such details later.

From the Initial Step Gas Comes In

In the preparation of syrups, which are solutions of sugar, more or less strong according to the object for which they are used, care should be taken to employ only the best refined sugar and either distilled or filtered rain water, as they will be rendered much less liable to spontaneous discomposition and become perfectly transparent without the trouble of clarifying. When, however, impure sugar is employed, clarification is always necessary. This is best done by distilling the sugar in the water or fruit juices cold, and then beating up some white of egg and a few ounces of cold water until the mixture froths well; this must be added to the syrup in the cauldron furnace or kettle about which more will be said later. Then, heat should be applied and the scum which forms removed from time to time with a good skimmer. As soon as the syrup begins to simmer it can be removed from the fire and allowed to stand until it has cooled a little, when it should again be skimmed if necessary, and then passed through a clean flannel. By using refined sugar, however, all of this trouble of clarification can be avoided.

When vegetable infusions or solutions enter into the composition of syrups they should be rendered perfectly transparent by filtration or clarification before being added to the sugar.

The proper quantity of sugar for syrups will in general, be two pounds to every pint of water or thin aqueous fluid. These proportions allow for the water that is lost by evaporation during the process and are those best calculated to produce syrup of proper consistency and possessing good keeping qualities. These closely correspond to those recommended by Guilbourt for the production of a perfect syrup which he says consists of thirty parts of sugar to sixteen parts of water.

Operation Must Not Be Hurried

In the preparation of syrup it is very important for the heat to be not only well regulated (as mentioned previously) but also that it shall be as little as possible, that is to say the operation must not be unduly hurried. It must be allowed to take sufficient time. This is due to the fact that a solution of sugar even when kept at 212 deg. Fahr.—the temperature of boiling water—undergoes slow decomposition. The best plan is to pour the water (cold) over the sugar and to allow the two to lie together for a few hours in a covered vessel, occasionally stirring and to apply a gentle heat to finish the solution. A water jacketed cauldron furnace is ideal for the purpose when the operation is carried out in this way, but most syrup makers refuse to take so much time and usually urge haste.

When the Syrup is Saturated

Gas men will do themselves no harm in knowing the true facts, however. Syrups are sufficiently boiled when some taken up in a spoon pours out like oil, or a drop on the thumb-nail gives a proper thread when touched. When a thin skin appears on blowing the syrup it is judged to be completely saturated. These wide tests however, often lead to errors which might easily be prevented by applying the proper proportions or determining the specific gravity by immersing in the syrup one of Baume's saccharo meters or syrup gauges as indicated in the following table:

Sugar in 100 Parts	Specific Gravity	Degrees Baume
0	1.000	0
5	1.020	3
10	1.040	6
15	1.062	8
20	1.081	11
25	1.104	13.5
30	1.128	16.3
35	1.152	19
40	1.177	21.6
45	1.204	24.5
50	1.230	27
55	1.257	29.5
60	1.284	32
67	1.321	35

A fluid ounce of saturated syrup wieghs 577½ grains; a gallon weighs 13½ lbs; its specifics gravity is 1.319 to 1.321 or 35 deg. Baume; its boiling point is 230 deg. Fahr. and its density at a temperature of 212 deg. Fahr. is 1.260 to 2.261 or 30 deg. Baume. The syrups prepared with the juices of fruits mark about two or three degress more on Baume scale than the other syrups. According to Ure, the decimal part of the number denoting the specific gravity of a syrup multiplied by the constant 26 gives very nearly the number of pounds of sugar it contains per gallon.

The writer understands this to be sugar per gallon of syrup—not sugar per gallon of water.

How Preserving Period May Be Prolonged

The preservation of syrups as well as of most saccharine solutions is best promoted by keeping them in a moderately cool but not a very cold place. Let syrups be kept in vessels well closed and in a situation where the temperature never rises above 55 deg. Fahr. They

(*Continued on page* 191.)

American Gas Engineering Journal

SIXTY-FIRST YEAR

Published Weekly by AMERICAN GAS LIGHT JOURNAL, INC., 150 Nassau Street, New York, N. Y.

Elbert P. Callender, Pres. S. G. Krake, Vice-Pres. Frederick A. Southworth, Sec'y-Treas.

EUGENE C. MILES, Editor

Subscription $3.00 per year, in cluding postage in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada, $4.00; foreign, $500—Single Copies, 10 cents

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As the Journal Views It

Has the American a Free Right to Make a Living?

Up at Worcester, Mass., some time ago they had a strike on the part of gas company employees. After the city's gas consumers were grievously inconvenienced the settling of the difficulty was shelved over onto the State Board of Conciliation and Arbitration.

Strikes nowadays, warranted or unwarranted, are of too frequent occurrence to justify a medium of national circulation in devoting a very extensive study to the rights or wrongs of any individual case. We did not, therefore, surfeit our readers with extensive reports on the Worcester affair.

But the workers of the Worcester company force themselves upon our attention, not to the extent of looking up back files to deduce if they are underpaid or overpaid—these details no longer are of moment—for the means they have adopted of compelling our attention are of a kind that chills any sympathy one might be inclined to have for them.

Their demands, brought forth through the State Board of Conciliation and Arbitration, place them outside the pale of good citizenship.

They want that:

None but union labor shall be employed by the company.

All new men shall be hired through the business representatives of the union.

All work in the course of alterations and replacements shall be done by members of unions affiliated

with the American Federation of Labor, and nothing purchased by the company, in the way of machinery or otherwise, shall be the product of shops considered by the union to be unfair.

Better indeed than that these demands should be granted that the city of Worcester be shut off from gas for a hundred years, for the granting of them would be to place in the hands of a particular individual or group the American citizen's opportunity of making a livelihood.

Such a thing is unthinkable; intolerable. We as a nation have attained what we have attained because honesty and industry alone have been the only real essentials to making a living.

The American workman, if he were a good workman, has never had to concern himself whether this or that man or group liked his face, his personal habits—provided they were moral—or his mode of thought. If he could produce he could command his place and come pretty close to commanding his compensation. He could laugh in the face of attempted domination.

Thousands of workmen are not union men; have decided prejudices against becoming union men. Are these men to be condemned to starvation?

We do not believe in the justice of debarring a workman from employment because he is a union man. Neither do we believe in debarring him from employment because he is not.

At times in the past magnates and capitalists have sought to deny to Americans things that the laws of their country entitled them to—and surely the free right to earn a livelihood is one of them—and they have gone to jail. Perhaps if a few of these *soi-disant* czars of labordom were sent to accompany them there might be a more general understanding of the fact that we are a free people and very jealous of our freedom of all kinds, especially of opinion.

Chickens Come Home to Roost

To-day the economic structure is but delicately poised.

There was a time when we could indulge in wasteful and extravagant by-plays and inconsistencies almost with impunity. There was apparently sufficient margin between profit and loss to absorb the waste.

To-day any considerable departure from distinct good business is quite frequently followed by a "bust."

It has been quite the fashion when a public utility wanted anything, reasonable or unreasonable, asked anything, to fight it tooth and nail.

If it wanted to open a street a deposit out of all proportion to possible damages through dereliction in obligations was exacted; often the wages of unnecessary political hirelings were imposed on it under the guise of inspection. When it had the street open everyone in the vicinity and out of it seemed to make it his special interest to annoy the company and keep adjusters working overtime.

And if an increase in rates were asked—Heavens, what a furor! Whether or not it was clearly manifest that the increase was called for made no difference whatever. The request, plea or demand, whatever it might be styled, was fought tooth and nail.

Even if no increase was asked the utility was given no rest. It must continually be contending against demands for decrease.

Life was just one darned thing after another, and only the lawyers and their benefactors, the politicians, waxed fat in prosperity.

The extravagance, the sheer wastefulness of all this, was many times pointed out.

But none heeded. There were no consequences.

Recently a big natural gas company sacrificed an expensive plant, gave up its franchise and pulled out of a territory it had served thirty-five years. Newspaper reports emphasize the hardships this action involves for the people and the industries of the territory abandoned, and remind us that for the past several years it was almost continually harassed by legal proceedings. It came to the pass when the cost of giving service and maintaining court actions got beyond the ability of the income to support it.

In this case the chickens have come home to roost. Worthy citizens who have permitted political aspirants to maintain in their name a utility-hounding "jag" will have ample food for reflection as they sit before their cold hearts through the months of the coming winter and broil over their fiery coal ranges in the following summer.

No one interested in the welfare of the public utilities wishes for them anything more than a fair deal. Exacting times like these are more or less an assurance that they will get it. Otherwise inevitably, through the natural working of the laws of economics, there will be consequences.

Gas Furnaces to Be Prominent at Steel Treaters Convention

Eight manufacturing concerns have signified their intention of reserving exhibition space for gas furnaces at the convention of the American Steel Treaters' Society, which will convene at the Seventh Regiment Armory during the week of September 22 and 27. A complete list of the manufacturers who will exhibit various products is at present unavailable, but it has been announced that the number will probably reach one hundred.

Those showing gas furnaces are: Chicago Flexible Shaft Company, Gilbert & Barker, Standard Fuel Emergency Company, Strong-Carlisle-Hammond, Modern Equipment Company, National Machine Works, Surface Combustion Company.

Where Gas Enters in the Making of Syrups

(*Continued from page* 188.)

are kept better in small than in large vessels as the longer a bottle lasts the more frequently will it be opened and the syrup constantly exposed by the air. By bottling syrups while boiling hot, and immediately corking down and tying the bottles, over with a bladder perfectly air tight, they may be preserved even at a summer heat for years without fermenting or losing their transparency.

It will thus be seen that the process of syrup making is a particularly simple one. Direct heat is employed as a rule, although a steam or water jacketed furnace is sometimes used. When great speed is needed blast burners can be substituted for atmospheric ones.

There is only about one kind of syrup made in a cauldron furnace namely chocolate, coffee or other similar syrups. All the rest are made without heat except in rare cases.

In making such syrups, water is poured into the kettle which is brought up to about boiling temperature. The requisite amount of sugar is added when the water is warm and when hotter the chocolate is also put in. It is then boiled and agitated for just a few minutes and then run off and bottled.

As mentioned above, blast burners are sometimes desirable with such a furnace and it is also of use to fit legs to the furnace for raising the height of the bibcock outlet (and incidentally of the furnace).

Variations from the standard type are required for certain syrups. The cast iron kettles may be galvanized, or white porcelain enameled, as conditions require. Or the furnaces can be equipped with kettles made of copper, either bare or tinned. For certain syrups the kettle, of whatever material it is made, must be water-jacketed.

Galvanized iron kettles are employed for finished "drinks" but seldom for syrups although there is no real reason against their use except where the product is of a highly acid nature. This applies to certain fruit syrups. Galvanized iron kettles are little attacked by alkalies of moderate strength. Galvanized iron is more readily cleaned than is bare cast iron, and it presents a more cleanly appearance.

Where the Copper Kettle is Employed

Copper kettles are employed where the product to be treated must be heated quickly, and must be protected against the possibility of being discolored either by that or by any scale which will sometimes accumulate on a cast iron kettle, even if galvanized. The copper kettle may be readily cleaned and polished, as it has a much more even surface than galvanized iron. Fruit acids have no effect whatever on polished copper. But the influences of the atmosphere will oxidize and tarnish the copper, and it is then readily attacked by very weak acids. Where the conditions of its use require absolute protection against trouble on this account, the copper kettle should be tinned. For example, confections made up chiefly of sugar or syrups may be prepared in bare copper; but soda fountain products which contain fruit acids should preferably be prepared in tinned copper kettles. The tin surface is not oxidized by the influences of the atmosphere, and consequently there is no danger of discoloration of the product being heated, even if it is of an acid nature.

A white porcelain enameled iron kettle is not attacked either by acids or alkalies of ordinary strength, and its smooth glazed surface is readily cleaned so that it is at all times free from the least incrustation. Such a surface is used where the product being heated would be ruined by the slightest discoloration.

A very common form of kettle for syrup making is steam jacketed and has to be employed with a gas fired steam boiler if steam is not already available. It has the disadvantage that the heat cannot be so well regulated as when the special gas heated syrup kettle already described is used, but it has the advantage that the jacketing extends only half-way and there is no chance of the syrup burning around the top edges of the liquid.

Prevents Candying

The candying of syrups may be prevented (unless the syrup be over-saturated with sugar) by the addition of acetic or citric acid to the extent of just about two or three grains per gallon. Confectioners add a little cream of tartar to the syrup to prevent granulation. Syrup may be effectually prevented from fermenting by the addition of a little sulphite of potassa or lime; also by the use of salicylic acid in small quantities fermenting syrups may be immediately restored by exposing the vessel containing them to the temperature of boiling water. The addition of a little spirit is also good. A solution of sugar prepared by dissolving two parts of double refined sugar in one of water and boiling this a little affords a syrup which neither ferments nor crystallizes.

The best way to keep fruit syrups from fermenting, is by bottling while hot into suitable bottles or larger vessels and to prevent access of air. This is the principle and it may be carried out in various ways. For instance fill the syrup while hot in quart bottles, previously warmed and fill them almost full. Cover or cork the bottles temporarily until the syrup cools a little and contracts in volume; then having heated a small quantity of the syrup refill the bottles, cork them securely and wax them.

Increasing the Variety

A great number and variety of syrups are made by the addition of proper flavoring ingredients to simple syrup; but in other cases especially when the juices of fruits are employed, the syrup is not first prepared and then flavored but the processes go hand in hand. In such instances specific instruction will be given. It is always advisable when fresh fruit can be obtained to use it in preference to the essence. One general recipe which answers for nearly all fresh fruit is as follows: Use nothing but the very best fresh fruit, which must be freed from stocks, etc., and crushed with a wooden instrument (not metal); when well mashed let it stand in a room of even temperature (about 68 deg. Fahr.) for four days which will give sufficient time for fermentation to take place (if ever); press out the juice from the fruit and let it settle in a cool cellar for two days after which five pounds of the clear juice is to be simmered with nine pounds of loaf sugar or multiples thereof. While warm strain through flannel. The color is sometimes augmented by the addition of a suitable coloring agent. It is advisable to add to the fresh fruit before setting it for fementation, about two pounds of powdered sugar for every 100 pounds of fresh fruit. When cold it is ready for bottling.

Cleanliness should be observed very strictly all through and the gas man will do well to see that his recommendations conform to this principle. When bottling for storing or shipment the top of any floating matter should be skimmed from the syrups in the kettle and it is necessary to see that no residue goes out into the bottles. For this reason the kettles which usually have an outlet should have a small amount of liquid drawn off first of all and refiltered after which the rest will usually be found to be clear. Most of the syrups not made of fruit may have a little mucilage of gum arabic added in order to product a rich froth. The writer gives some common recipes which comprise syrups made from the fruit and also from essences. These may be varied to suit taste and requirements. It will be a guide to the industrial man when calling upon the manufacturer of syrups and it will do no harm to show that he has a little knowledge of the subject. Moreover, there are a number of "small men" just starting in, in a small way, and they will welcome good advice as well as good equipments.

Almost any syrup may be made by the addition of a sufficient quantity of flavoring essence to simple syrup, but these artificially prepared syrups are inferior to those made from fresh fruits.

To make syrups frothy.—To each gallon of syrup add two to four ounces of gum arabic dissolved in its own weight of water.

Preparation of syrups.—In discussing at some length the various pharmacopoeial methods for the preparation of syrups a medical writer comes to the conclusion that with but very few exceptions—where heat would deleteriously affect the product—dissolving the sugar by heat and raising it to the boiling point is the best. To insure the best results the author lays down these rules:

1. Employ only the best grade of cane sugar, for the lower grades of sugar contain appreciable amounts of glucose which incline to fermentation. Follow closely the quantities indicated in formula. Concentrated saccharine solutions resist fermentation in a much higher degree than more dilute ones. On the other hand, there will be loss from crystallization if syrups prepared by heat are stored in too cool a room.

2. Use none but absolutely clear vegetable extracts seeing to it that after ebullition the syrup may be perfectly bright; the latter object may be accomplished by the customary aids such as the addition of albumen (white of egg) or pure filtering paper pulp before bringing the syrup to a boil. This does not apply of course to naturally turbid syrups such as syrup of almonds. Even with most aromatic syrups, the loss of volatile constituents can be but trifling if the process of boiling be properly conducted; the inversion of saccharose may be left out of consideration especially when fruit acids are absent provided the solution of the sugar be completed at a low temperature and then rapidly raised to the boiling point; albuminous substances are frequently extracted from the raw material which boiling will remove; all fermentative germs and fungus spores are effectually destroyed by the heat.

Finally, to insure perfect preservation syrups should be filled into small vials (of from two to eight ounces capacity according to individual needs) which have been placed into boiling hot water, the vials to be immediately corked or sealed. As an extra precaution it is well to lay the filled and corked bottles on their sides while yet hot and to maintain that position. A French proposition is to fill the bottles to the brim and while the contents are still warm, to place on top so as to come in contact with the syrup a circular piece of filtering paper. A firm cover of crystallized sugar is thus obtained, well calculated to exclude all extraneous matter.

Strikes Abounding

By S. G. Addison

With our own desperate financial condition constantly haunting us, with strikes and threats of strikes all about us, it is difficult to look upon this matter from a non-partisan viewpoint.

Whose fault is it principally, this hair-trigger readiness to strike, this incessant threat to paralyze industry —that of the management or that of the worker?

It may be that labor is purely gone wild, that drunk with its own power it is simply running amuck.

Can we the management be true to our trust and let it do so; desperately toss up our hands and declare it is impossible to do so otherwise?

Most decidedly we cannot. The trust that is reposed in our hands does not require of us merely the accomplishment of the easy things, but the accomplishment of the difficult, the impossible as well. If labor is simply running amuck we must find the means of bringing it to reason. Our job is to protect the property that is given into our hands. There can be no such a thing as impossible situations. Ours is the duty to find the way out. It is thus that our mettle is tested and proved.

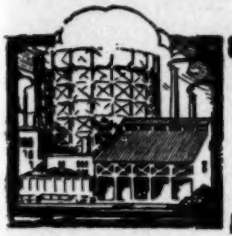
Or is it a case that labor is not running amuck, that high as its payment seems it is not yet high enough under present conditions to permit it to live? Then truly we must expect nothing less than strikes. Rather must the plight of our workers appeal to our sympathy.

It is then clear that the relief they ask must be given them. And again the problem. We are against a stone wall in increasing our own income. Put this further drain upon it and we go bankrupt. Again our responsibility. Again our impossible task. And the worst of it is we *must* accomplish it.

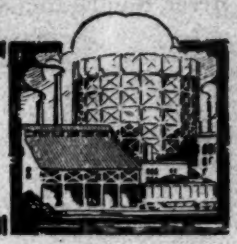
Big Gas Flow Struck in Tennessee

Considerable excitement prevailed in Dickson, Tenn., and the surrounding community recently over the striking of a big gas well by the Tuxbury Oil & Refining Company at Cumberland Furnace, in the north end of Dickson County. So great was the volume and force of the gas that it lifted the tools, weighing over 3,000 pounds, clear out of the hole, and then began spouting stones and rocks all over.

It was necessary for the men working on the well to shut off all the fires in the boiler and blacksmith forge and shut down the drilling until they could get in material with which to shut it off. It is understood that if they can get rid of the gas they will drill on down deeper for the oil, which product they were seeking when the drill entered the gas flow. The gas was found at about three hundred feet and oil men now on the field state that it is a certain indication of an oil field in that county.



NEWS OF THE GAS INDUSTRY



"Great Efficiency in Every Branch of Service"

Carrying out its slogan of "Greater Efficiency in Every Branch of Service," the Pennsylvania Utilities Company, of Easton, Pa., is making improvements in every department. Experts are making a survey of the gas lighting service, especially with reference to pressure in various localities. These experts will make recommendations from which it is hoped to improve the gas service.

Extensions to Meet Winter Fuel Demand Nearing Completion

The new unit of the main plant of the New Orleans Gas Light Company is well on the way to completion, and will be finished in September, it was announced by General Manager John S. Bleecker.

The foundation of the unit has been completed, and two-thirds of the material and equipment is on hand. The rest is on the way.

The new unit, which will add considerably to the New Orleans gas supply, is intended to meet the demand for winter fuel.

A lease has been signed for two additional regulator stations, Mr. Bleecker said. The new regulators are to reduce the holder pressure of 16 inches to the main pressure of about 3½ inches.

$2.00 Rate Approved for Augusta Gas Company

Two dollar gas now prevails in the city of Augusta, Ga., the Public Utilities Commission having approved of the increased rates. As showing the increased cost of manufacture, Superintendent Williams said the net balance of the gas company for 1917 was $4,855 and for 1918 it was $2,704, while for the first five months of 1919 the net balance was but $196. The gas plant is valued at $250,000, and on the basis of 6 per cent the returns ought to be about $15,000, but Superintendent Williams says the company will scarcely make $600 this year.

Twelfth Annual Convention Canadian Gas Association

Many Papers—Numerous Side Features—A Number of Excellent Discussions—Many Well-Known Gas Men in Attendance—All Together Went to Make the Twelfth Annual Meeting of the Canadian Gas Association at Niagara Falls, Canada, One of the Best in Its History

It would take some real hard work and splendid effort to excel the businesslike and interesting convention which the Canadian gas men concluded at Niagara Falls, Ont., Aug. 21 and 22.

From first to last there was not a minute which was not put to some good use in the uplift of the gas industry. Many ladies, wives and friends of members took advantage of the natural surroundings of Niagara Falls as a holiday resort and came along.

Had International Character

It was a meeting that partook of an international character, since a large number of well-known Canadian and American gas men took part. Among the guests who were in attendance and took part in the discussions or were called upon to speak might be mentioned the following:

Col. Oscar H. Fogg, secretary-manager American Gas Association, New York, who brought greetings and best wishes from that association; William M. Crane, New York; Leigh Wickham, St. Louis; Arthur V. White, consulting engineer Commission of Conservation, Ottawa, Canada, who delivered an address and paper of international importnace on the "Future Fuel Problems of Canada," a paper which all assembled thoroughly believed should be given wide publicity; Major Stargenski, of the Schenectady Illuminating Company, Schenectady, N. Y., who is a man who was very much to the fore in American military affairs during the war, particularly in that division which had to do with the production of "mustard gas" and other poison gases; Major J. J. Humphries, late of the United States but now superintendent of the department of gas manufacture for the Montreal (Quebec) Light, Heat & Power Company; R. O. Wynn-Roberts, consulting engineer, Toronto; F. G. Curfman, engineer, New York; F. J. Kennedy, West's Gas Improvement Company, England; Mayor Stevens, Niagara Falls, Ontario, who gave the association a hearty welcome to that city, as also did Malcolm Meldrum, president Niagara Falls Chamber of Commerce, and others.

President C. C. Folger and Secretary George W. Allen were very much in evidence, for upon them fell a great deal of the work of preparing for the meeting, as there was no local company at the Falls to assist in looking after many of the local details.

While most of the party came from the various points of Canada via Toronto by boats to the convention, still many came by rail, auto or other transportation. Those having automobiles materially assisted toward the success of the meeting by placing them at the disposal of delegates who desired to go to many of the points of interest.

Executive Committee Enlarged

The first session of the association opened promptly at 10 a. m. in the convention hall of the Clifton House hostelry. President C. C. Folger was in the chair and wasted no time in getting down to business, and it was not many minutes before the session was in full swing.

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River Bend Company Granted Increase

By its showing to the California State Railroad Commission at a recent meeting held at Kingsburg, Cal., that during the months of January and February of this year the company sustained a loss of $1,600 a month and $1,094 a month during March and April, all indicating a loss for the year of $5,600, the commission granted the request of the River Bend Company for an increase in rates. As against the present rate of $1.10 charged the small consumer, the new rate will be $1.20, subject to a discount for prompt payment. The larger consumers will also have to pay more for their gas, the new schedule calling increases varying from 6.7 per cent to 14 per cent, depending upon the quantity used. On a consumption of 20,000 cu. ft. of gas under the old rate the bill would l. $27.00, under the new rate, $31.00.

U. G. I. Gets Contract for 3,500,000 Cu. Ft. Water Gas Apparatus

A contract for carbureted water gas apparatus, of 3,500,000 cu. ft. capacity per day has been awarded to the U. G. I. Contracting Company, of Philadelphia, Pa., by the Michigan Light Company, for its Flint, Mich., plant. It is reported that all the gas companies throughout the country are resuming their construction programs.

Comparison of Year's Business in Gas Appliance Sales

A comparison of this year's business in gas appliances, with that of the previous year made by the Chicago gas companies shows a preponderance in favor of the sale of the present year. The most marked purchasing movement on the part of the public is in the direction of water heating apparatus of both standard types—the tank and the automatic heater has added to the sales of the heaters in this district.

During June and July the Public Service Company of Northern Illinois ran the names of local plumbers and dealers in its advertisements of heaters announcing an arrangement whereby the same terms of easy payments made by the company were also available to buyers who placed their orders with the mentioned dealers. The method was successful and led to decidedly better sales by the local merchants.

Unusual sales in gas heaters have resulted from the impression by residents of this district that there is likelihood of a coal shortage. Ordinarily gas heaters do not sell until the approach of cold weather, but sales during the month of July soared unusually. Orders were taken for radiantfire heaters,, delivery to be made on receipt of first payment, the customer to make succeeding payments beginning October 1.

President Daly Urges New Philadelphia, Ohio, to Manufacture Gas

If the new contract for New Philadelphia, Ohio, with the East Ohio Gas Company is adopted by the City Council, New Philadelphia consumers will pay a "readiness to serve" charge of 60 cents per meter each month. This is a new feature. Rates are increased, heavy consumers being penalized disproportionately greater than the smaller consumers. The object is to prevent waste in furnaces where the greater amount is wasted.

A rate of 48 cents a 1,000 ft. for the first 5,000 ft. consumed; 53 cents a 1,000 ft. for the next 5,000 ft.; 58 cents a 1,000 for the next 5,000 ft. and for all gas consumed over 15,000 ft. at rate of 63 cents is charged.

President Daly suggested that New Philadelphia, Ohio, citizens form a company for the manufacture of gas. Daly offered to sell mains and pipes to the company for 50 cents on the dollar. Manufactured gas, it was claimed by Daly, with one-half of the number of heat units of natural gas, would virtually cost $3 for the same number of heat units of natural. Its cost per 1,000 cu. ft. is $1.50.

Chicago Water Heater Display Attracts Thousands

Thousands of Chicagoans promenading on Michigan Boulevard are attracted daily to the automatic water heater demonstration in the windows of the Peoples Gas Light & Coke Company.

The display consists of two automatic instantaneous gas water heaters which are connected with faucets placed on the sidewalks outside the windows. The faucets run into funnels which resemble ordinary drinking fountains, which are connected with the sewer. A small darkened chamber runs from each heater to the glass plate, and a mirror is placed on the floor of the window in such a position as to reflect the bottom parts of the heaters.

The passer-by simply steps up to the "fountain," presses the handle of the faucet, and at the same time looks into the mirror. The pressure on the handle of the faucet causes the "automatic" to light up, and at the same time permits one to test the heat of the water. The water passing out of the faucet has been heated by the flame seen in the mirror. The moment the pressure on the faucet is released the gas goes out.

The demonstration is proving an educational feature to persons who otherwise know little or nothing of the modern gas industry.

Pacific Service Spends $75,000 in Pasadena

The cost of improving the Pasadena, Cal., distributing system which is now being completed by the Pacific Gas & Electric Company has reached a total of $75,000, due largely to high cost of materials.

Kinston Gas Plant Probable

Indications point to the possibility of a gas plant being built this fall at Kinston, N. C., the cost to be less than $100,000 and financed by a municipal bond issue.

Traverse City Wants Improved Plant

Stating that Traverse City, Wis., may at any moment be without gas service, due to breakage of machinery that has been in constant operation eighteen years, the Traverse City Gas Company, represented by its president, A. V. Friedrich, appeared before the city commission with a petition for an increase in rates that will warrant expansion of the present plant to do away with danger of a breakdown and to care for increase business.

June 2, 1919, the gas company appealed to the commission for an increase of 10 per cent in rates. The matter at that time was referred to a committee consisting of the city attorney and the entire commission. Nothing further has been done, the reason being set forth at the conference. The company now asks an increase of more than 10 per cent, the amount to be set by the commission following an inves-

tigation of the figures on the company's books and the physical property of the concern.

Natural Supply About Exhausted for Angelica and Belfast

Patrons of the Producers Gas Company in Angelica and Belfast, N. Y., have been notified that, owing to exhaustion of the natural gas supply, their services will be cut off Dec. 1.

Gas Plant for Lemoore a Likely Possibility

Almost enough subscribers for service have signed statements of intention to use gas to assure the erection of a contemplated gas plant at Lemoore, Cal.

New Plant at Chico

Because of the necessity of greatly increased production Chico, Cal., the Pacific Gas & Electric Company has extended its plans for the improvement of its Chico gas plant, until an expenditure of $40,000 will be involved.

As a result of the altered plans, one of the oldest brick buildings in Chico will have to make way before the march of progress. The old brick gashouse erected in 1875, and in constant use since that date, will be razed and supplanted by a steel column, corrugated iron building. The new building alone will cost in the neighborhood of $12,000.

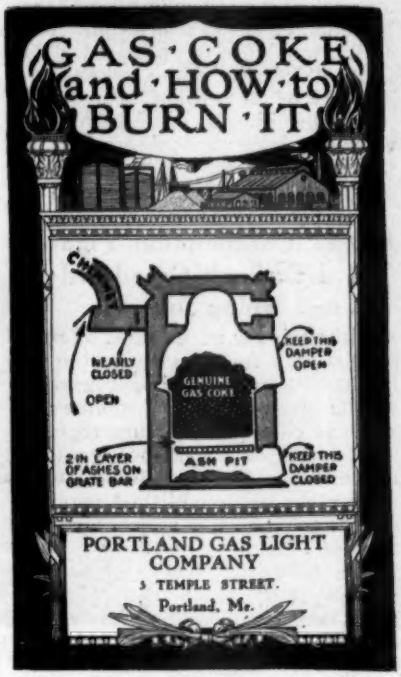
New equipment to be installed will include an improved Jones gas set, the invention of E. C. Jones.

It is declared that the improved system was made necessary by the growing demands of Chico. Gas sales in 1918 increased over those of 1917 between 30 and 40 per cent.

It is expected that the company will be making gas on the new set by Nov. 1, but the new building will be completed at a later date.

20-Cent Lift at Palestine

The gas company at Palestine, Tex., has been granted an increase of 20 cents in the gas rate by the city council. The old rate was $1.50 per 1,000 cu. ft., but after receiving sworn statements that the company was losing money the council gave them an increase to $1.70 per 1,000 cu. ft. of gas.



"Gas Coke and How to Burn It"

The Portland (Me.) Gas Light Company has gotten up and is distributing a booklet on "Gas Coke and How to Burn It." It tells briefly and in clear-cut fashion what gas coke is and how to use it. The paragraphs "How to Build the Fire" with gas coke, "How to Keep the Fire," "What to Do in the Morning" to get a hot fire within ten minutes and "What to Do at Night" to keep the house warm all through the night are simple and to the point. The booklet also points out a salient feature of the gas-coke fire, "Big Volume of Fire Under Very Little Draft."

W. L. Rodgers, Principal Speaker at Northwestern Home Appliance Annual Convention

W. L. Rodgers, president of the Pittsburgh Gauge & Supply Company, who was in charge of all the gas engine production of the Government during the war, was the principal speaker at the annual convention of the Northwestern Home Appliance Association, on Friday and Saturday, August 15 and 16. It is said of Mr. Rodgers that he knows more about housekeeping than any housewife in the country. He has given the greater part of his lift to a study of household drudgery and is credited with having done as much to lighten the work of women as any other man.

The convention was held at the Radisson Hotel, Minneapolis, and delegates from all the Northwestern States attended. Everything that is new and modern in the way of home equipment was shown, and particular attention was given to the gas heated utensils.

Mayor Meyers welcomed the delegates and R. Hilgedick, of the Kelley Hardware Company. Duluth, was chairman. A. P. Brill of the Ruud Manufacturing Company gave a gas meter demonstration on Friday afternoon, which was followed by a discussion.

Ocean County Company Also Sends Up S. O. S.

The Ocean County Gas Company, which supplies the entire shore from Toms River to Tuckerton, N. J., has petitioned the public utilities board for an increase of rate from $1.55 to $2.05, plus service charge of $3 per year.

Employment Problems to Be Discussed at Safety Council Convention

Some of the most important problems before American industry today, such as the anticipation of labor unrest, increasing plant efficiency and production, decreasing manufacturing costs and the whole subject of labor management, will be discussed in connection with the general subject of accident prevention at the Eighth Annual Safety Congress of the National Safety Council in Cleveland, October 1 to 4.

The great bulk of the accident prevention talent of the country—160 scheduled speakers and approximately 3,000 men and women who direct the safety work of the nation's greatest industries—will come together for a four-day exchange of ideas and experiences. The Council has adopted the following slogan for the congress:

"We have fought to make the world safe for Democracy; let us now work to make industry safe for humanity."

There will be four general sessions, four round tables, and 35 sectional meetings during the congress. As all the general sessions will open at 2 o'clock in the afternoon and the sectional meetings at 9.30 o'clock in the

morning it will be possible for any one to attend all the general sessions and also all the sectional meetings for his particular industry. There will be three meetings each of the metals, mining and steam railway sections, one meeting each of the marine and navigation and textiles, and two meetings of each of the following sections; automobile, cement, chemical, construction, electric railway, health service, packers, paper and pulp, public safety, public utilities, rubber, woodworking, and women in industry.

The first general session will be devoted entirely to a discussion of employees representation under the following subheads: "Co-operation and Industrial Progress," "Labor Management and Collective Bargaining," "Practical Aspects of Employees' Representation" and "Employees' Representation from the Standpoint of Organized Labor."

A nationwide campaign to make the street and the home as safe for the workman and his family as is his factory will be launched at Cleveland, O., in connection with the Eighth Annual Safety Congress. Though not generally known, it is a fact that from two to three times as many fatal accidents occur in American homes, streets, and roads each year as in the industries of the country.

As the death or incapacitation of a skilled workman has the same detrimental effect on industry whether the accident occurs in the shop, on the street, or in the home, the National Safety Council now considers itself almost as vitally interested in public safety as in industrial accident prevention. During the nineteen months of our participation in the war with Germany 50,150 American boys died in battle or as a result of wounds received in action. During that same period back here in peaceful America approximately 126,000 men, women and children lost their lives in accidents. Of this number almost two-thirds were killed in accidents outside of industrial plants.

This is one of the problems that will be brought before the 3,000 safety engineers, safety supervisors, safety teachers, plant managers and municipal, State and Federal officials who will constitute the safety congress at Cleveland. In conjunction with the congress a practical demonstration of what can be accomplished in public safety work will be had in the No-Accident Week to be conducted by the city of Cleveland. During a similar campaign in St. Louis the week of the last convention of the National Safety Council only one person was killed as compared to 24 accidental deaths in the corresponding week of the previous year.

It is the ultimate aim of the council to bring about such observance of safety precautions throughout the country every day in the year.

Actual Consumption Figures of a Difficult Case-Hardening Job

Although the advantages offered by gas-fired furnaces for carburizing have been generally recognized in the past from such points of view as close temperature regulation, decreased attendance, greater convenience, etc., very little information has been published regarding the consumption figures for this process.

The following details of actual consumption figures of a "Revergen" furnace, made by the Davis Furnace Company, upon case-hardening work are of interest. The Revergen type of furnace is provided with regenerators and is fired with city-manufactured gas at ordinary pressure, the air being introduced to the furnace at a slight pressure of about 3 in. or 4 in. water gauge. The figures here recorded are not the result of any specially prepared test run, but merely an odd case-hardening job which was undertaken to oblige some customers whose requirements were that the material was to be charged into a cold furnace, raised to 900 deg. Cent. and maintained at that temperature for eight hours to give the necessary depth of case. The work consisted of automobile gear wheels packed in six boxes, the total weight being 713 lb.

The required temperature of 900 deg. Cent. was obtained in seventy minutes from lighting up, the figures recorded being as follows:

	Per Pound	Total
Gas to raise furnace and charge from cold to 900 degrees	1.29 cu. ft.	925 cu. ft.
Gas to maintain 900 deg. for first hour	0.38 cu. ft.	275 cp. ft.
" " " " second hour	0.42 cu. ft.	300 cu. ft.
" " " " third hour	0.38 cu. ft.	275 cu. ft.
" " " " fourth hour	0.42 cu. ft.	300 cu. ft.
" " " " fifth hour	0.49 cu. ft.	350 cu. ft.
" " " " sixth hour	0.49 cu. ft.	350 cu. ft.
" " " " seventh hour	0.45 cu. ft.	325 cu. ft.
" " " " eighth hour	0.45 cu. ft.	325 cu. ft.

The overall gas consumption for this run of nine hours ten minutes was only 4.8 cu. ft. per pound of load.

From the above figures it is, of course, possible to readily calculate the approximate quantity of gas required for any period of carburizing and therefore for any depth of case.

Preventing Accidents from Workmen Handling Acids

In response to requests from a great many industries in which acids and caustics are used the National Safety Council has just issued Safe Practices No. 25, an orderly presentation in 16 pages, loose leaf form, of accident hazards involving acids and caustics and the best practices for the elimination of such hazards.

This bulletin, representing the efforts and knowledge of the Conference Committee of fifty safety engineers, is one of the most important safe practices pamphlets yet issued by the Council and probably the most concise collection of information on the subject. It includes a brief discussion of accident hazards and the best practices for their elimination, involved in handling the most common industrial acids and caustics as follows:

Nitric acid, sulphuric acid, mixed acid, hydrochloric acid, hydrofluoric acid, carbolic acid, oxalic acid, picric acid, acetic acid, carbonic acid, hydrocyanic acid, alcohols, ammonia, caustic soda, caustic potash, soda ash and lime.

It has been the experience of the members of the National Safefty Council that three-fourths of all accidental deaths and injuries in industry can be eliminated and this is as true of acid and caustic accidents as of any other class. Safe Practices No. 25 is profusely illustrated, among the photographs shown being one picturing complete protection for workmen in a metal pickling room, the effect of acid on clothing, ventilating system for removing acid fumes, a one-man two-wheel carboy carrier, protection of acid valves and others.

GROUP PHOTOGRAPH OF THOSE IN ATTENDANCE AT CANADIAN GAS ASSOCIATION CONVENTION

Twelfth Annual Convention of Canadian Gas Association

(*Continued from page* 193.)

The minutes of the previous executive committee meetings were read and confirmed, showing much work performed by this body. The report of Secretary-Treasurer Allen showed a substantial balance to the credit of the association, notwithstanding heavy expenditures during the past year. This report was received with appreciation by the members and friends, who voiced their approval by much applause.

The president's address was heartily indorsed, seeing it contained much food for thought. This address is published elsewhere in this issue.

A nominating committee was appointed by the executive committee to recommend to the association the names of office bearers for the year 1919, and were given instruction to bring in their report at the Friday morning, Aug. 22, session.

The reading and discussion of papers took up the remainder of the morning and afternoon sessions, and on Friday the nominating committee for election of office bearers presented its report but not before a motion having been moved and seconded that the executive committee be increased by the addition of two members.

The following well-known gas men were recommended to the association for approval, who, needless to say, were heartily indorsed by all present:

For President—V. S. McIntyre, superintendent Kitchener Light and Power Commission, Kitchener, Ont.

Vice-President—C. S. Bagg, secretary-treasurer Montreal Light, Heat & Power Company, Montreal, Quebec.

Second Vice-President — E. H. Caughell, manager light and power department, St. Thomas, Ontario.

Secretary-Treasurer — George W. Allen, advertising manager Consumers' Gas Company of Toronto.

The following members were elected to the executive board: Arthur Hewitt, Toronto, Ontario; C. A. Jefferis, Toronto, Ontario; J. S. Norris, Montreal, Quebec; C. C. Folger, Kingston, Ontario; J. P. King, Stratford, Ontario; J. M. H. Young, London, Ontario; W. H. McIntyre, Ottawa, Ontario, and A. A. Dion, Ottawa, Ontario.

The first paper to be read was one by E. M. Paterson, superintendent new-building bureau, Consumers' Gas Company of Toronto, and entitled "Co-operation with the Plumbers, Manufacturers and Dealers (To Be or Not to Be)."

This paper is an exceedingly valuable one and cannot help but be useful to all gas managers who are interested in the sale of gas and gas appliances through dealers or otherwise. This paper ought to be read by others, and, although somewhat extensive, has been published in this journal (Aug. 23). Mr. Paterson covered very ably and fully the great measure of success he had met in dealing with plumbers, dealers and others along co-operative lines. His paper was a very practical one and was largely the experiences of Mr. Paterson while engaged on such work by the Consumers' Gas Company of Toronto. Quite a few took part in the discussion, among whom might be mentioned H. L. Schutt, W. B. Johnson, F. H. Knapp, A. P. Brill, Edwin Newsome, Arthur Hewitt, W. M. Crane, Harry Dains and W. H. McIntyre.

J. E. Philpott, hotel and restaurant equipment department of the Consumers' Gas Company of Toronto, gave a paper on the results of that company's endeavors to interest hotel men, school boards and other public institutional men in the hotel and domestic science equipment problem.

In discussing this paper William M. Crane, New York, stated some facts concerning the modern gas equipment installed in many New York hotels.

An open discussion here followed on the question of gas purification, especially such as pertained to small town gas works.

H. Stansfield-Dodd, inventor of the Dodd system of heating homes with gas, delivered an illustrated talk in the afternoon on some of the results achieved by his gas boilers in some of the homes of Toronto, Canada.

House Heating with Gas

Quite a number took the occasion to discuss the question of house heating with gas, and many points of interest were brought out. Mr. Dodd's system is almost foolproof, and is entirely automatic in every respect. It may be interesting to know that Mr. Dodd's heaters are installed in several large homes in Toronto and have displaced coal entirely as a heating element.

Mr. Dodd's paper was illustrated by lantern views.

A paper worthy of comment was one by R. O. Wynn-Roberts, consulting engineer of Toronto, and entitled "Cheaper Gas." Mr. Wynn-Roberts is heart and soul a conservationist, for his paper advocated the greater and more efficient utilization of our national fuel resources and Government action permitting gas companies to manufacture a gas of lower B.t.u. standard than that in common practice to-day.

An open discussion on Mr. Wynn-Roberts' paper and many valuable points pertaining to the B.t.u. value of the various available fuels and the possibility of their utilization were brought out.

The first day's session closed with an open discussion on the question of minimum bills, charging for service where a block system of rates exists and how many cubic feet of gas should be in first block, second block, etc.

From the discussions that followed one would gain that this question was a vital one to the industry. It was pointed out by one member that the electric industry had made considerable headway in this regard, and it was suggested that the association's secretary get in touch with various organizations and companies that had block systems of rates in force, and it was also suggested that a committee be formed to take up the question at an early date.

Friday's session opened early with an excellent and valuable paper by J. A. A. Beaudin, manager collection service department, Montreal Light, Heat & Power Company, Montreal, Quebec. The paper was entitled "Piece Work System as Applied to Meter Readers, Billers, Delivery Men and Collectors," and ably described how this system was working in Montreal. This paper was published in our Aug. 23 issue.

It was at this point that Arthur V. White's paper on "Future Fuel Problems of Canada" was presented to the association. A digest of this paper is given special consideration in this week's issue. Much discussion followed the presentation of the paper. One member said it was too important a one to be let go by without something being done to give it wide publicity. One suggestion was that a copy be sent to every member of the Canadian and American governments.

Col. Oscar H. Fogg, secreary-manager American Gas Association, stated that he felt such a paper should be read by every member of his association, and to this end desired a special copy for early insertion in the *American Gas Bulletin* be sent to him as soon as possible.

Three open discussions on subjects as follows ended up the sessions: "Plans to Insure Proper Gas Piping Being Installed in Buildings"; "Plans for Promoting Better Understanding Between Employer and Employee and Between the Gas Company and Its Consumers," and "Advantages of Horizontal Gas Ovens for Small Town Plants."

The retiring president at this point introduced the new president, V. S. McIntyre, to the meeting. After a few remarks he called the twelfth annual meeting to a close.

A special car took about thirty-five members on a tour of inspection of the world-renowned hydroelectric Chippewa Creek electrical development work, where the Ontario Hydro Power Commission is spending $11,000,000 to further extend the power facilities of Canada. Approximately 450,000 additional horsepower of electrical energy will be developed at this new plant. Frank Clark, assistant field engineer for the commission, conducted the party over the work and explained what was being done. Altogether it was a very interesting trip and much appreciated by those who took it in.

Quite a number took advantage of the proximity of the Ontario Niagara Falls power plant to go down the 1600-ft. shaft to inspect the sixteen large generators developing 200,000 hp. at the foot of the famous Horseshoe Falls.

On Thursday evening, Aug. 21, one of the finest banquets ever put on by the association took place in the Clifton House banquet hall, with nearly all the members and their friends present. The head table was honored by the presence of the officers and directors of the association, besides other distinguished guests in the persons of Mayor Stevens, Niagara Falls; Malcolm Meldrum, president Chamber of Commerce, Niagara Falls; Col. Oscar H. Fogg, Alphonso "Pop" Mason, Lucius Bigelow and others.

Following a sumptuous repast, accompanied by the hotel orchestra, the president announced a toast to the King, which was heartily responded to by all present. In honor of the association's American visitors, and to show the association's desire to have cordial relationships existing between the Canadian gas men, the president announced a toast to the President of the United States, and it would have done the President's heart good to have heard the response to same. This was followed by a singing of "My Country, 'Tis of Thee."

The Mayor of Niagara Falls, Ontario, and Malcolm Meldrum, president of the Chamber of Commerce, followed, extending a real welcome to the members on this occasion of their twelfth annual meeting, and both stated they hoped this convention would not be the last one to attend the city, that entertained thousands from every part of the globe each year.

Frank Oldfield, one of Toronto's best male singers, was brought over to the convention by the association to entertain at the banquet. Mr. Oldfield rendered many of his selected and most popular pieces during the evening, being assisted by Miss Davis, of Toronto. The Clifton House dance hall was thrown open to the association following the banquet, and a number took part in this added feature.

Chambersburg Company to Extend System

At a meeting of the stockholders of the Chambersburg (Pa.) Gas Company Aug. 20 a lease for a long term of years with the associated gas company, holding a charter for practically all of the townships surrounding Chambersburg, was ratified.

It is the purpose of the Chambersburg Gas Company to extend its system. At the present time the line has been extended to a point near Stoufferstown and workmen are laying main pipes across the highway at various points. The pipes across the highway are intended to care for the extensions eastward after the construction of the Lincoln Highway is completed.

Devises Means of Reducing High Cost of Living—Fined!

Charles Nichols, 214 West North Street, Indianapolis, recently tried to reduce the high cost of living by tampering with his gas meter. He found out, after a hearing in the city police court, that the plan was rather an expensive one after all. Nichols was arrested by Detectives Duncan and DeRossette on charges of petit larceny. The detectives testified in court that Nichols had perfected an arrangement by which he could disconnect the meter at intervals. Nichols' gas bill ran between $3 and $4 a month a few months ago, the detectives said, but by his arrangement he had reduced his cost to 80 to 90 cents a month. He was fined $5 and costs on the charge of tampering with a gas meter, the larceny charge being dismissed.

General G. & E. Companies Acquiring New Properties

The General Gas & Electric Company is acquiring the New England properties formerly owned by the Eastern Power & Light Corporation. The combined gross earnings of all the companies to be controlled by the General Gas & Electric after this acquisition, for 12 months ended May 31, were $8,478,142.89.

Profits Milked Out by Needless Litigation Natural Gas Company Pulls Up Stakes at Jamestown and Falconer

After continuing service in Jamestown and Falconer, N. Y., for more than thirty years, the Pennsylvania Gas Company has made formal announcement to its patrons here that it will surrender its franchise and abandon its business in Jamestown early next spring.

The notice is to give patrons sufficient time to arrange for some other kind of fuel. Practically every home in the city is supplied with natural gas for fuel and lighting, and many of them have no other means of heating. Many factories depend upon natural gas for power.

The plant of the Pennsylvania Gas Company in Jamestown is worth at least $500,000, but the company says it has demands for more gas than it can possibly supply in Pennsylvania, and that the annoyance of doing business under control of the public service commissions of two States is greater than the profits it secures here.

Jamestown has been in litigation with the company for more than two years in efforts to control the price charged for gas and over other matters of service by the company, causing it great annoyance as well as loss of money and costs of litigation. Mayor Carlson recommends holding a conference with officers of the company in an effort to arrange mutually satisfactory terms whereby the litigation will be discontinued and the decision of the company reversed.

Worcester (Mass.) Workmen Would Not Only Control Their Own Company, but the World at Large

A new demand has been made by employees of the Worcester (Mass.) Gas Light Company for a complete recognition of the Gas Workers' Union, not only in the employment of men, but in the purchase of everything entering into the plant.

Their committee has submitted to the company a working agreement, as provided under the decision of the State Board of Conciliation and Arbitration.

The employees demand that the company place its plant on a strictly union basis, reiterating in this the demand made in the beginning of the trouble, which resulted in the strike, and submission of the case to the State board.

The working agreement submitted by the men provides that none but union labor shall be employed by the company, excepting that a non-union man may be employed, providing he becomes a member of the union within ten days from the time of his employment. Otherwise he shall be discharged by the company. All new men shall be hired through the business representatives of the union.

The agreement further provides that all work in the course of alterations and replacements shall be done by members of unions affiliated with the American Federation of Labor, and that nothing purchased by the company in the way of machinery or otherwise shall be the product of shops considered by the union to be "unfair." It is specially mentioned that all iron castings purchased shall be produced in shops that are not held to be "unfair," which include all Worcester foundries where strikes are in progress.

President Willard Osborne of the company, when questioned on the working agreement, declined to make any statement.

Intensive Courses in Industrial Selling

Intensive training courses in industrial selling are being introduced by the Peoples Gas Light & Coke Company, of Chicago, with great effectiveness. The sales engineers, most of whom are just out of technical schools, are taken in groups of twenty-five or so and put through a month of concentrated training. As a result the company reports a steady influx of enthusiastic and well-equipped men into its industrial division.

The plan tried out on the first group of men was two weeks of instruction at the company's industrial laboratory, followed by one week of selling under the supervision of a seasoned industrial salesman. The fourth week the men went out alone and got business.

With the second group the plan was extended and a comprehensive lecture course was arranged under the direction of O. E. Norman, the new educational director of the company. The course consisted of lectures, demonstrations and tours, and reading in the company's library. The lectures were given in each case by the man best qualified to cover the subject, and a large number were therefore given by the superintendents themselves.

Expressions of great enthusiasm were heard from the superintendents at the response they had gotten from the sales engineers. They declared that the attention and the intelligent reception of facts made by the men was the best sort of indorsement of the courses, and they sent out the men feeling that they knew the company's policy and the sources of further information at least.

Following is an outline of the course just completed:

(a) Lectures by company's engineers and superintendents; also by representatives of outside firms.

(b) Demonstration at industrial laboratory, and inspection tours.

(c) Reading assignments on the subjects of lectures in the company's library.

1. Manufacture of Gas.—By J. H. Eustace, chief engineer: July 29,

1919, Thursday, 2.30 p. m.

2. Distribution of Gas.—By H. E. Bates, assistant to the engineer; July 30, Wednesday, 2 p. m.

3. Meter Reading.—By John Thompson, general order department; July 31, Thursday, 11 a. m.

4. (a) Hotel and Restaurant Division's Work.—I. A. Hoy; Aug. 1, Friday, 11 a. m. (b) Selling Gas for Steam Boilers.—R. N. Davis; Aug. 1, Friday, 1 a. m.

5. Lighting Division's Work.—By C. A. Luther; Aug. 2, Saturday, 11 a. m.

6. (a) Mechanism of a Meter.—By G. A. Lane, superintendent West Meter Shop; Aug. 4, Monday, 10 a. m. (b) Water Heating Division's Work.—By R. A. Cameron and G. C. Carnahan; Aug. 4, Monday, 11 a. m.

7. Organization; Aug. 4, Tuesday, 11 a. m. (a) Purpose and types of organization; History of the Peoples Gas Light & Coke Company; Functions of main departments; Directory of all departments.—By A. L. Tossell, assistant treasurer. (b) Detailed description of the duties of departments with which the sales engineer comes most frequently in contact; Method of handling an order and requisition from the time it leaves the commercial department until it reaches the completed files.—By P. D. Warren, superintendent application department.

8. Chemistry of Gas.—By R. B. Harper, chief chemist; Aug. 4, Tuesday, 2 p. m. Candle-power, calorific value, meters, combustion theory, flame temperature.

9. Atmospheric Burners.—By D. W. Chapman, industrial division; Aug. 6, Wednesday, 9 a. m. to 12 a. m. Their construction and application.

10. Domestic Division.—By H. L. Dunavan, superintendent; Aug. 6, Wednesday, 2 p. m.

11. Blast Burners.—By D. W. Chapman, industrial division; Aug. 7, Thursday, 9 a. m. to 12 a. m. Their construction and application.

12. Laundry Division.—By W. R. Roberts, superintendent; Aug. 7, Thursday, 2 p. m.

13. Collection and Credit.—By J. M. Roberts, collection department; Aug. 7, Thursday, 3 p. m.

14. Selling Industrial Appliances.—By F. F. Cauley, industrial department; Aug. 8, Friday, 10 p. m. Securing a prospect; Inspecting plant; Planning the installation; Presenting, Developing and Closing the Proposition.

15. Bookkeeping Department.—By E. J. Davies, superintendent; Aug. 8, Friday, 2 p. m.

16. Systems for Mixing Gas and Air Combustion.

17. Materials Used in Furnace Construction.

Personal Notes

F. H. Mugg, formerly gas efficiency engineer of the Oklahoma Gas & Electric Company, has been placed in charge of the gas department of the Muskogee Gas & Electric Company. Previous to his connection with the first named company Mr. Mugg was industrial gas engineer for the San Diego (Cal.) Consolidated Gas & Electric Company. He is the author of various technical articles on industrial installations and efficient use of gas, a number of which have been published in the American Gas Engineering Journal, and has done considerable lecturing and other educational work on kindred subjects.

E. M. Smith, auditor of the Muskogee Gas & Electric Company, Muskogee, Okla., as been transferred to the Oklahoma City office of the Oklahoma Gas & Electric Company. George H. Richardson, of the Oklahoma Company succeeds him at Muskogee.

Stanley B. Sherman, for some years superintendent of the Central Illinois Light Company, at Peoria, Ill., has severed his connection with that company and goes to Racine, Wis., where he becomes superintendent in full charge of the properties of the Wisconsin Gas & Electric Company. Mr. Sherman has been with the company which owns the Central Illinois Light Company for sixteen years and during most of that time has held important positions with them, in charge of manufacture.

J. B. Douglas, manager of the claim department of the United Gas Improvement Company, of Philadelphia, has been nominated a director of the National Safety Council. The nomination, which has been submitted by the nominating committee to the secretary of the council, is for the re-election of Mr. Douglas, who has served as a director for three years. Twenty-four other nominees will be voted on at the next annual meeting of the council, whose directorate includes 75 persons, 25 of whom are chosen each year.

A. S. Witmer, formerly of the commercial department of the Louisville Gas & Electric Company, has been selected to head the Million Dollar Industrial Foundation of that city. The Foundation, under the leadership of Tampton Aubuchon has secured the location of 25 new factories in Louisville during the past two years.

Louis Resnick, lately St. Louis representative of the American Gas Engineering Journal and previous to that its editorial representative at Chicago, has been appointed director of publicity for the National Safety Council, with offices at 168 North Michigan Avenue, Chicago, Ill.

Colonel H. M. Byllesby is serving on the special technical jury appointed to investigate and report on the cause of the recent dirigible balloon disaster of Chicago. Colonel Byllesby is also treasurer of the Illinois State Committee for the National Celebration of Constitution Day, September 17. This movement is in connection with efforts which are being made to counteract Bolshevism and other non-American influences.

Captain W. S. Wyche, of the Second Engineers, U. S. A., has returned from overseas and rejoined the Arkansas Valley Railway, Light & Power Company, Victor, Colorado. Captain Wyche was twice honored for bravery in action. Once he was decorated with the Croix de Guerre with palm conferred by Marshal Petain, and once he received a special enlarged citation from General Pershing.

J. F. Owens, vice-president and general manager of the Oklahoma Gas & Electric Company, has been made president of the new War Camp Community Club, which has just been organized in Oklahoma City. The organization is for the purpose of providing entertainment, suitable welcomes and employment for returned soldiers.

John J. Kirkpatrick, manager of the city gas department of Holyoke, Mass., entertained the Massachusetts State Gas Commission. The commissioners were Chairman A. R. Weed, Gen. Morris Schaff and Solomon Lewenberg.

More Indiana Increase

The Knightstown Natural Gas Company has just filed a petition with the Public Service Commisison of Indiana, asking for 100 per cent increase in its gas rates. The petition sets out that the present primary charge for gas is $1 a 1,000 cu. ft. and it asked that the rate be increased to $2 a 1,000.

The Indiana Gas Transportation Company, gas distributors for the Northern Indiana Gas & Electric Company has petitioned for an increase in the rate for transportation of gas from 5 cents to 15 cents a 1,000 cu. ft.

Testing for Gas Field in Alexandria, La.

According to advices from Alexandria, La., a thorough test will be made in a well being drilled for the city to determine if gas can be obtained in paying quantities. Commissioner E. F. Hunter is quoted as saying that the well will be drilled to sufficient depth and every effort made to develop a gas or oil field, or perhaps both, in Alexandria.

City Mayor Files Rate Complaint

The mayor of Cohoes, N. Y., has filed complaint with the Public Service Commission against rates charged for gas by the Cohoes Power & Light Company, which went into effect on March 3.

The mayor asks that the price of gas for light and fuel in Cohoes be reduced from $1.30 to "a price which will render a fair return to the Cohoes Power & Light corporation upon the capital actually invested, and which will not be oppressive and unfair to consumers." The mayor also asks that the company be directed to improve the purity and efficiency of the gas and to discontinue a minimum charge of 50 cents a month a meter, and that the company be directed to install prepayment meters upon the application of consumers.

The mayor alleges that the minimum service charge is illegal and in violation of law, and that the 30 cent increase in rates is "excessive, unjust and unwarranted."

Alliance, Ohio, Will Get Gas from West Virginia

Alliance, Ohio, will have natural gas after November 1, when the East Ohio Gas Company threatens to cut off the supply. The Alliance Gas & Power Company announced that it had negotiated a contract, subject to the approval of the city, for a supply from the West Virginia Natural Gas Company, with offices at Salem, O. The gas will cost more, it is understood, than is now being paid. The present price is 50 cents a 1,000.

Hard Pressed by High Costs in Indiana

A number of petitions from gas companies throughout Indiana recently have been filed with the Public Service Commission of that State. The Columbus Gas Light Company, of Columbus, has filed petitions, asking for a temporary increase in rates. The company says it has suffered a loss of $2,892.82 from January 1, 1919, to June 1, 1919, and that a former surcharge of 15 cents on each 1,000 cu. ft. of gas sold and an increase of the minimum bill to 75 cents, has been offset by a decrease in the former amount of gas consumed of 2.74 per cent. The petition leaves the amount of the needed increase up to the commission.

The Lawrenceburg Gas Company, of Lawrenceburg, which operates an artificial gas plant, has just filed a petition with the commission asking authority to add a "readiness to serve" charge to its schedule of rates. The new charge would be 50 cents a meter a month, according to the petition and merely would operate to create a minimum. With this addition to its present rates, the petition points out, the rates of the company still would be below the franchise authorization. The rates of the company now range from $2.50 a 1,000 ft. to lower marks.

The Northern Indiana Gas & Electric Company has filed a petition asking for authority to strike from a former order of the commission, in which a surcharge of 8 cents a 1,000 cu. ft. was authorized on certain of the company's plants in the State, a provision which would have required the company to set aside a depreciation fund amounting to 1½ per cent as of July 1, this year. The returns to the company, under the surcharge authorized by the commission, are not sufficient to keep the revenues of the company at a point which would allow of such a depreciation fund.

Because of abnormal costs of operation it has been found that the surcharge allowed will not meet requirements, the petition sets out. The company therefore petitions the commission to be allowed to refrain from setting aside the depreciation requirement in the former order. The petition pertains to several cities and towns in which the company operates.

The Batesville Gas Company, of Batesville, which supplies natural gas, has petitioned the commission for authority to increase its rates from $1.65 a 1,000 to $2.00 a 1,000 cu. ft. for the first thousand feet. The present rates of the company range from $1.60 to 65 cents and the only change contemplated is in the first rate.

Gas Plant Workers Form Helpful Employees Association

Articles of incorporation have just been filed with the Secretary of State of Indiana by the Langsdale Employees' Association of the Langsdale Avenue plant of the Citizens Gas Company, of Indianapolis. The association will be self-governing and was formed for the purpose of promoting good fellowship and assisting in bettering general working conditions at the plant. Twelve directors, selected from various branches of the plant, will administer the business affairs of the association. A commissary will be operated by the association and athletics, games and entertainments will be arranged for. The filing of the articles marks a radical departure from the usual attempts to better conditions at gas company plants for the employees. This association, springing from among the workers themselves, is expected to do much towards keeping radical labor troubles from the plant.

Conversion Features of Empire Gas & Fuel Notes

Henry L. Doherty & Co., has issued a circular on the salient features of the conversion features of Empire Gas & Fuel Company 6 per cent bond secured sinking fund convertible notes of 1924. These notes are immediately convertible into the 8 per cent cumulative preferred stock of Empire Gas & Fuel Company and this conversion privilege possesses several features of value to investors which are pointed out in the new circular.

The cumulative preferred stock of Empire Gas & Fuel Company pays monthly dividends at the annual rate of 8 per cent and the earnings are six times the dividend requirements.

New Holder Costing $45,000 for Modesta Company

Frank A. Cressy, Jr., president and general manager of the Modesto (Cal.) Gas Company has announced that he has completed the arrangements of a contract for a new big gas holder. The cost of the tank will be $45,000. It will be 100 ft. high and 90 ft. in diameter, weighing enough to require twelve cars to bring the steel to Modesto for setting up. Its holding capacity will be 300,000 cu. ft of gas. The present tank of the gas plant measures only 30 ft. high and 55 ft. in diameter, with a holding capacity of 50,000 cu. ft.

This is one of the big improvements at the Modesto gas plant. Some $20,000 will be spent in betterments and extensions of the distributing system. The company was recently permitted to issue and sell $65,000 in new bonds for improvements and enlargements to meet the growing demands incident to the expansion of Modesto. Mr. Cressey's plans anticipate a doubled population here within the next few years.

Northern Indiana Authorized to Issue $1,067,000 in Notes

The Northern Indiana Gas & Electric Company has been authorized by the Public Service Commission of that State to issue notes to the extent of $1,067,000 to meet costs of betterments and improvements.

$12,000 Gas Plant Building to Be Erected in Pittsburg

Waldo Coleman, president of the Contra Costa Gas Company and the Coast Counties Gas & Electric Company of California, was in Pittsburg, Cal., recently and stated that work would commence immediately on a steel building to house the gas plant of the Contra Costa Gas Company in Pittsburg. The building will cost approximately $12,000. Cahill & Vensano, of San Francisco, have the contract for erecting the structure.

Several months ago the old wooden building which housed the gas plant was destroyed by fire and much of the machinery was made worthless. This gas plant supplies gas for Pittsburg, Antioch, Concord, Martinez, Bay Point and Crockett.

Sell Stock to Liquidate Dividends

Directors of the Standard Gas & Electric Company, of Chicago, have voted to liquidate the 13 per cent accumulated dividends on the preferred and common stock. Net earnings for the six months show the full 4 per cent for the preferred and 3.52 per cent on the common shares, including the increased common stock, due to the payment of the accumulated dividends on the preferred.

THE CAMBRIDGE GAS LIGHT COMPANY, of Cambridge, Mass., has made its annual distribution of a percentage of the profits of the past year among the employees, amounting to 5 per cent of their wages.

PACIFIC GAS & ELECTRIC COMPANY'S gross earnings are reported running at the rate of $27,000,000 annually compared with 1918 earnings of $22,595,516.

STANDARD GAS & ELECTRIC COMPANY reports combined gross and net earnings of its utility subsidiaries for the month of June and year ended June 30, together with comparisons with corresponding previous periods, as follows:

June—	1919	1918
Gross earnings	$1,961,564	$1,662,409
Net earnings	728,492	670,085
Year ended June 30—		
Gross earnings	25,630,028	21,076,672
Net earnings	9,480,961	8,585,959

WESTERN STATES GAS & ELECTRIC COMPANY is prospering, according to the company's report for June and for the twelve months ended June 30, 1919, which reads as follows:

Twelve months, gross earnings	$1,756,616	$244,297
Twelve months, net earnings	707,282	53,609
June, gross earnings	158,558	25,613
June, net earnings	70,185	17,761

Annual Meeting of Brockton Company Held

At the annual meeting of the stockholders of the Brockton (Mass.) Gas light Company the following officers were elected: President, Marcus Beebe; vice-president, J. S. Bartlett; treasurer, M. P. Clough; clerk, C. S. Purinton; directors, all of the above and B. N. Johnson, R. C. Morse, H. K. Morrison, Ex-Mayor Stewart B. McLeod, G. H. Priest.

The directorate was increased from eight to nine for the purpose of giving additional representation to Brockton, George H. Priest, general manager, being the new member.

"The books of the company indicate that the increase in operating expenses has so nearly balanced the increased income that the surplus for the year, after making proper charges to depreciation and reserve funds, is only nominal," it was stated. This is in spite of the fact that for 18 months no dividends have been declared.

THE SANDUSKY GAS & ELECTRIC COMPANY has motorized both its gas and electric departments, thus doing away entirely with horses.

OHIO CITIZENS GAS COMPANY at a meeting of its directors authorized the regular quarterly common stock dividend of $1, payable Sept. 1 to stock of record Aug. 15.

Producers for Glass Plants

At Kane, where millions of feet of gas were consumed daily in the manufacture of window glass, gas producers have been installed at some of the glass plants.

The United Natural Gas Company and the Pennsylvania Gas Company spent thousands of dollars during the past two years in search of gas, but the majority of the wells struck were poor producers and a great many dry wells. The cities and towns in this section will not be the only sufferers as many places in Pennsylvania and New York secured their gas in the fields in this section. Buffalo and Erie alone consume millions of feet of gas daily, which is produced from local fields.